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A REVIEW OF THE AMERICAN ELEOTRIDINÆ.

BY CARL H. EIGENMAN AND MORTON W. FORDICE.

We have attempted to give in this paper the synonymy of the genera and species of *Eleotridinæ* found in the waters of America, with analytical keys by which they may be distinguished. All the specimens examined belong to the Museum of the Indiana University, most of them having been collected by Professor Jordan.

All the species are referred by Dr. Günther to a single genus, *Eleotris*. This group, however, seems to us rather of the nature of a subfamily. An examination of the skeletons of some of the species shows important differences, which we must regard as having generic value.

We place the American species in six genera, which may be characterized as follows :—

Analysis of Genera of Eleotridinæ.

Common Characters.—Ventral fins separate, each with one spine and five soft rays; dorsal spines six or seven.

- a. Vomer with a broad patch of villiform teeth; isthmus very narrow; gill-openings extending forward below to posterior angle of mouth; teeth villiform, the outer scarcely enlarged; vertebræ, 12 + 13 (*dormitator*); skull above with conspicuous elevated ridges, one of these bounding orbit above; the orbital ridges connected posteriorly above by a strong cross-ridge; a sharp longitudinal ridge on each side of the occipital, the two nearly parallel, the post-temporals being attached to their posterior ends. Insertions of post-temporals widely separated, the distance between them greater than the rather narrow interorbital width; the post-temporal bones little divergent; top of head depressed, both before and behind the cross-ridge between eyes; a flattish triangular area between this and the little elevated supraoccipital region; preopercle without spines; lower pharyngeals with slender depressible teeth, and without lamelliform appendages; scales of moderate size, ctenoid.

Gobiomorus. 1.

- aa. Vomer without teeth; isthmus broad; gill-openings scarcely extending forward below to posterior angle of preopercle; skull without crests.

- b. Body and head entirely scaly.
- c. Lower pharyngeal teeth setaceous, the bones with an outer series of broad flexible lamelliform appendages or teeth; body short and elevated, cyprinodontiform; teeth slender, those in the outer row scarcely larger, and movable; top of head without raised crests, flattish, its surface uneven; post-temporal bones rather strongly diverging, the distance between their insertions about half the broad flattish interorbital space; no spine on preopercle or branchiostegals; scales large, ctenoid. Species herbivorous. DORMITATOR. 2.
- cc. Lower pharyngeals normal, subtriangular, the teeth stiff, villiform, none of them lamelliform; scales of moderate or small size; body oblong or elongate.
- d. Body moderately robust, the depth $4-5\frac{1}{2}$ times in the length to base of caudal; cranium without distinct median keel; a small supraoccipital crest.
- e. Post-temporal bones little divergent, not inserted close together, the distance between their insertions greater than the moderate interorbital space, or $3\frac{1}{2}$ in length of head; top of skull little gibbous; interorbital region somewhat concave or channeled; lower pharyngeals narrower than in *Eleotris*; preopercle without spine; scales very small, ctenoid, about 100 in a longitudinal series. Vertebræ, 11 + 13; teeth moderate, the outer series enlarged. GUAVINA. 3.
- ee. Post-temporal bones very strongly divergent, their insertions close together, the distance between them about $\frac{2}{3}$ the narrow interorbital space, and less than $\frac{1}{2}$ the length of the head; top of skull somewhat elevated and declivous; interorbital area slightly convex transversely; lower pharyngeals rather broad, the teeth bluntish; preopercle with partly concealed spine directed downward and forward at its angle; scales moderate, ctenoid, 45 to 60 in a longitudinal series. Vertebræ (*pisonis*) 11 + 15; teeth small.¹ ELEOTRIS. 4.

¹ These characters of the skeleton are taken from *Eleotris pisonis*, and have not been verified on other species.

dd. Body very slender, elongate, the depth about $\frac{1}{3}$ the length to base of caudal; post-temporal bones short, strongly divergent, the distance between their insertions about equal to the narrow interorbital space, or about $\frac{1}{6}$ length of head; top of head with a strong median keel, which is highest on the occipital region; no supraoccipital crest; preopercle without spine; mouth very oblique; the teeth small; scales very small, cycloid. EROTELIS. 5.

bb. Body naked on the anterior part; head naked; lower jaw with four larger recurved teeth. GYMNELEOTRIS. 6.

1. GOBIOMORUS.

Gobiomorus Lacépède, Hist. Nat. Poiss., ii, 599, 1798 (*dormitor*, etc.).
Philypnus Cuvier & Valenciennes, Hist. Nat. Poiss., xii, 255, 1837 (*dormitator*).

Lembus Günther, Cat. Fish. Brit. Mus., i, 505, 1859 (*maculatus*).

Gobiomorus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 571 (restricted to *dormitator*).

This genus is well characterized by the presence of vomerine teeth, and by the narrowness of the isthmus. Equally good characters may be taken from the cranium, which is provided with elevated, longitudinal and transverse ridges, which are not found in any other of our genera of this type. The species reach a larger size than those of our other genera.

The reasons for preferring the name *Gobiomorus* to *Philypnus* have been given in detail by Jordan and Gilbert (*loc. cit.*).

Analysis of Species of Gobiomorus.

Common Characters.—Body elongate; the head somewhat depressed; body compressed behind. Scales ctenoid; 55 to 66 in a longitudinal series. Dorsal with 7 spines and 9 or 10 rays; anal rays I, 9 or 10; lower jaw considerably projecting; teeth in jaw rather small, slender, recurved, the outer scarcely enlarged; teeth on vomer villiform, in a broad crescent-shaped patch; gill-openings extending forward to below posterior angle of mouth, the isthmus being very narrow. No preopercular spine; insertion of post-temporals almost midway between occipital crest and edge of skull; parietals with a crest running from insertion of post-temporal forward to just behind eye, where they are connected

by a thin, high, transverse crest; supraocular with a short high crest, extending from above front of eye back to posterior edge of orbit, thence extending outward parallel with the transverse crest, leaving a deep groove between them; bony projections before and behind eye prominent. Vert. 12+13 (*dormitator*); lower pharyngeals triangular, with slender teeth.

- a. Scales large, 55 in a longitudinal series; 28 scales on median line between occiput and front of spinous dorsal. Body robust; depth 4 in length; head $2\frac{3}{4}$. D. VI-1, 9; A. I-10; crests on skull very high. *Lateralis*. 1.
- aa. Scales moderate, 57 to 66 in longitudinal series; head 3 to $3\frac{1}{2}$ in length; depth 5 to 6.
- b. Scales in median line from occiput to front of spinous dorsal 26; head $3\frac{1}{2}$ in length; transverse frontal crest not continuous. D. VI-1, 9; A. I-10; 57 to 60 scales in a longitudinal series. *Maculatus*. 2.
- bb. Scales on median line from occiput to spinous dorsal 35; transverse frontal crest continuous.
- c. Scales medium, 57 to 60 in a longitudinal series; head $3\frac{1}{4}$ in length; depth $5\frac{1}{2}$. D. VI-1, 9; A. I-9; crests on skull moderate. *Dormitator*. 3.
- cc. Scales smaller, 66 in a longitudinal series; depth 6 in length; head 3. D. VI-1, 10. *Longiceps*. 4.

1. *Gobiomorus lateralis*.

Philypnus lateralis Gill, Proc. Acad. Nat. Sci. Phila., 1860, 123 (Cape San Lucas); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 232 (West Coast Mexico); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 368 (Cape San Lucas); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 372 (Colima); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 377 (Panama); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 380 (San José).

Eleotris lateralis Günther, iii, 122, 1861 (Cape San Lucas).

Habitat.—Pacific Coast of America, from San José to Panama.

This species represents on the Pacific Coast the *G. dormitator* of the Atlantic. It is readily distinguished by its shorter body, larger scales, and by the greater development of its cranial crests.

2. *Gobiomorus maculatus*.

Lembus maculatus Günther, Cat. Fish. Brit. Mus., i, 505, 1859 (Andes of Ecuador); Günther, Proc. Zool. Soc. Lond., 1860, 236 (Ecuador, Esmeraldas).

Eleotris lembus Günther, Cat. Fish. Brit. Mus., iii, 121, 1861 (Ecuador).

Habitat.—Streams of Ecuador.

This species is known to us only from the descriptions of Dr. Günther.

3. *Gobiomorus dormitator*.

Guavina Parra, Descr. Dif. Piezas Hist. Nat. Cuba, tab. 39, fig. i, 1787 (Havana; fide Poey).

Gobiomorus dormitor Lacépède, Hist. Nat. Poiss., ii, 599, 1798 (from a drawing by Plumier).

Gobiomorus dormitator Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 572 (name only).

Platycephalus dormitator Bloch, Syst. Ichth., Plate xii, 1790 (Martinique); Bloch & Schneider, Syst. Ichth., 60, 1801.

Eleotris dormitatrix Cuvier, Règne Animal, ed. ii, 1829 (Antilles); Oken, Naturgeschichte, vi, 173, 1836; Günther, iii, 119, 1861 (Barbadoes, Jamaica, Mexico).

Philypnus dormitator Cuvier & Valenciennes, xii, 255, 1837 (Porto Rico, San Domingo, Martinique); Poey, Mem. de Cuba, ii, 381, 1856 (Cuba); Girard, U. S. and Mexican Boundary Survey, 27, plate xii, fig. 13, 1859 (Rio Grande); Poey, Syn. Pisc. Cub., 395, 1868 (Cuba); Poey, Enum. Pisc. Cub., 128, 1875 (Mexico, Rio Grande, San Domingo, Martinique, Jamaica); Goode & Bean, Proc. U. S. Nat. Mus., 1882, 236 (name only); Jordan & Gilbert, Syn. Fish. N. A., 631, 1882.

Batrachus guavina Bloch & Schneider, Syst. Ichth., 44, 1801 (based on *Guavina* of Parra).

Habitat.—Rio Grande to Martinique, in fresh waters.

This species is generally common in the streams of the West Indies and Eastern Mexico. We follow later writers in changing the incorrectly spelled *dormitor* of Lacépède to *dormitator*. According to Poey, the type of Parra's *Guavina*, still preserved in the Museum at Madrid, has teeth on the vomer, and is therefore a *Gobiomorus*, not a *Guavina*. The many specimens examined by us are from Havana.

4. *Gobiomorus longiceps*.

Eleotris longiceps Günther, Proc. Zool. Soc. Lond., 1864, 151; Günther, Fish. Central America, 1869, 440 (Nicaragua).

Habitat.—Lake Nicaragua.

This species is known to us only from Dr. Günther's description.

2. DORMITATOR.

Prochilus Cuvier, Règne Animal, ed. i, 1817 (*mugiloides*), (preoccupied).

Dormitator Gill, Proc. Acad. Nat. Sci. Phila., 1862, 240 (*gundlachi* = *maculatus*).

This genus is not adopted by Dr. Günther, but it seems to us well founded, its peculiarities in dentition being important. The name *Prochilus* at first given to this group is preoccupied by *Prochilus* of Illiger, a genus of mammalia, as well as by the prebinominal *Prochilus* of Klein, which belongs to the Pomacentridæ.

The known species of this type are very closely related and should perhaps be regarded as geographical varieties of a single one.

Analysis of the Species of Dormitator.

Common Characters.—Body short, robust; head broad and flat above; mouth little oblique; maxillary reaching to anterior margin of orbit; lower jaw little projecting; no teeth on vomer; scales large, ctenoid, 30 to 33 in a longitudinal series; skull much as in *Eleotris*, but everywhere broader. D. VII-1, 8; A. I, 9 or 10; no spine on preopercle; post-temporals inserted midway between occipital crest and edge of skull; supraoccipital crest low.

- a. Scales large, becoming much smaller on belly; 25 series on a median line from base of ventrals to vent; 18 series across breast from pectoral to pectoral; 18 on a median line from posterior border of orbit to dorsal. Interspace between dorsals equal to orbit. Highest anal ray $1\frac{3}{4}$ in head; highest dorsal ray $1\frac{1}{2}$ in head. 33 scales in a longitudinal series.

Maculatus. 5.

- aa. Scales larger than in *maculatus*, not much smaller on belly; 18 series on a median line from ventrals to vent; 13 series from pectoral to pectoral; 16 on a median line from posterior border of orbit to front of soft dorsal; interspace between dorsals less than diameter of orbit. Highest anal ray $1\frac{1}{2}$ in head; highest dorsal ray equals head. 31 scales in a longitudinal series.

Latifrons. 6.

5. *Dormitator maculatus.*

Sciæna maculata Bloch, "Ichth., tab. 299, f. 2," 1790 (West Indies); Bloch & Schneider, Syst. Ichth., 80, 1801 (copied).

Eleotris maculatus Günther, iii, 112, 1861 (West Indies; Trinidad; Demerara); Günther, Fish. Cent. Am., 440, 1869 (Anamah).

- Dormitator maculatus* Goode & Bean, Proc. U. S. Nat. Mus., 1882, 236 (Gulf of Mexico).
Eleotris mugiloides Cuvier & Valenciennes, xii, 226, 1837 (Martinique; Surinam).
Eleotris somnolentus Girard, Proc. Acad. Nat. Sci. Phila., 1858, 169 (Rio Grande); Girard, U. S. and Mex. Bound. Survey, 28, pl. 12, f. 1-3, 1859 (Rio Grande); Günther, iii, 557, 1861 (Cordova).
Dormitator somnolenta Poey, "Repert., ii, 168," 1868; Poey, Enum. Pisc. Cuben., 128, 1875 (Cuba).
Eleotris omocyaneus Poey, Memorias, ii, 269, 1860 (Havana).
Dormitator omocyaneus, Poey, Syn. Pisc. Cuben., 296, 1868 (Cuba); Poey, Enumer. Pisc. Cuba, 128, 1875 (Cuba).
Eleotris gundlachi Poey, Mem., ii, 272, 1860 (Cuba).
Dormitator gundlachi Poey, Syn. Pisc. Cuben., 396, 1868 (Cuba); Poey, Enum. Pisc. Cub., 128, 1875 (Cuba).
Dormitator lineatus Gill, Proc. Acad. Nat. Sci. Phila., 1863, 271 (Savannah).

Habitat.—East Coast of America; South Carolina, Texas, Louisiana, south to Surinam; chiefly in fresh water.

As Cuvier and Valenciennes have identified the type of Bloch's *Sciæna maculata* with their *Eleotris mugiloides*, we adopt the latter name for this species. We are unable to distinguish the *somnolentus* of Girard from *maculatus*, and the *omocyaneus* of Poey is certainly the same. Gill's *lineatus* is also, doubtless, a young example of the same type.

We find nothing (unless it be the greater height of the fins) in the description of *Eleotris gundlachi* Poey, by which it can be distinguished from *Dormitator maculatus*. Poey's type was about 8 inches in length, and its large size may account for the slight differences indicated.

The single specimen studied by us is from the West Indies.

6. *Dormitator latifrons*.

- Eleotris latifrons* Richards, "Voy. Sulph. Fishes, 57, pl. 35, f. 4-5," 1837 (Pacific Coast Central America).
Eleotris maculata Günther, iii, 112, 1861 (Guayaquil), (not *Sciæna maculata* of Bloch).
Dormitator sp., Bean, Proc. U. S. Nat. Mus., 1880, 83 (Colima).
Dormitator maculatus Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 232 (Salina Cruz); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 368 (Cape San Lucas); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 372 (Colima); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 377 (Panama); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 380 (Cape San Lucas); Jordan & Gilbert, Bull. U. S. Fish. Com., 1882, 108 (Mazatlan); Jordan & Gilbert, Syn. Fish. N. A., 1883, 632 (Mazatlan).

Dormitator microphthalmus Gill, Proc. Acad. Nat. Sci., Phila., 1868, 170 (Panama).

Habitat.—Pacific Coast of Central America, from Cape San Lucas southward to Panama.

This species is abundant on the Pacific slope of Mexico and Central America. It differs from *D. maculatus* in few respects, and should, perhaps, be regarded as a variety of the latter. They have, however, not yet been shown to intergrade.

3. GUAVINA.

Guavina Bleeker, Esquisse d'un Syst. Nat. Gobioid., 302, 1874 (*guavina*).

This genus is externally distinguished from *Eleotris* only by the absence of preopercular spine, and by the smaller size of the scales. The skulls in the two genera are, however, strikingly different, and we think that the two groups should be regarded as generically distinct. We know only one species of this genus.

Analysis of Species of Guavina.

- a. Body stoutish, oblong; mouth oblique; maxillary reaching opposite middle of eye, its length about $3\frac{1}{2}$ in head. Lower jaw little projecting. Teeth in broad bands, the outer ones enlarged. Scales on head imbedded; those on body very small, ctenoid on sides, cycloid on back and belly, 100 to 110 in a longitudinal series. Isthmus very broad. Pectorals reaching to middle of spinous dorsal. Highest anal ray $1\frac{4}{5}$ in head. Head $3\frac{1}{2}$ in length to base of caudal; depth $4\frac{1}{2}$ to $5\frac{1}{4}$. D. VI, I, 10; A. I, 9 or 10. Post-temporals inserted twice as far from occipital crest as in *Eleotris pisonis*. Parietals ending in a sharp point behind. Preopercular spine none; a broad thin extension on the lower limb of preopercle taking its place. Lower pharyngeals triangular, normal, rather narrow; the teeth small. Vomer without teeth. *Guavina*. 7.

7. *Guavina guavina*.

Eleotris guavina Cuvier & Valenciennes, xii, 223, 1837 (Martinique); Günther, iii, 124, 1861 (Demarara); Poey, "Repert. i, 337, 1867;" Poey, Syn. Fish. Cuba, 395, 1868 (Cuba); Poey, Enum. Pisc. Cuba, 127, 1875 (Cuba).

Habitat.—East Coast of tropical America, West Indies, south to Surinam, in fresh waters.

This species is abundant in the streams of Cuba. The numerous specimens examined by us were obtained by Prof. Jordan in the Rio Almendares, near Havana. In life this species may be readily distinguished from *Eleotris pisonis*, which abounds in the same waters, by the bright cherry-colored edgings to its ventrals and anal.

4. ELEOTRIS.

Eleotris "Gronow, Mus. Ichthyol., 16," 1757 (Non-binominal).

Eleotris Bloch & Schneider, Syst. Ichth., 65, 1801 (*pisonis*).

Eleotris Cuvier & Valenciennes, xii, 216, pl. 356, 1837 (*gyrinus*).

Culius Bleeker, Esquisse d'un Syst. Nat. des Gobioides, 303, 1874 (*fuscus*).

As *Eleotris pisonis* possesses the preopercular spine assumed to characterize the genus *Culius*, we place the latter name in its synonymy. In large specimens of *Eleotris pisonis*, this spine is somewhat concealed by the flesh, but it may always be found by dissection. The four following species resemble each other very closely, and probably agree in the structure of the skeleton, but in this regard we have been able to examine only *Eleotris pisonis*.

Analysis of Species of Eleotris.

- a. Body comparatively robust; head broad, depressed; body compressed; mouth oblique, lower jaw little projecting; maxillary reaching to below eye; scales ctenoid, 46 to 61 in longitudinal series. Dorsal rays, VI-I, 8; anal rays, I, 7 or 8. Vomer without teeth. Gill-openings extending forward below to angle of preopercle; isthmus broad. Preopercle with a spine projecting downward and forward at its angle. Post-temporals slender, widely diverging, inserted very near the scarcely evident occipital crest. Skull highest in the middle, very broad and short; bony projections in front of and behind eye prominent. Vertebrae about 10 + 14 (*pisonis*). Lower pharyngeals subtriangular, rather broad, with comparatively coarse teeth.
- b. Scales large, about 48 in longitudinal series; depth $4\frac{1}{2}$ in length to base of caudal; head $3\frac{1}{4}$. D. VI, 9; A. I, 8; teeth rather small, those of the inner series in each jaw largest. *Amblyopsis*. 8.

- bb. Scales moderate, about 60 in lateral series. D. VI-I, 8; A. I, 7 or 8.
- c. Body comparatively robust; depth 4 to 5 in length; teeth in jaws all small, subequal. *Pisonis*. 9.
- cc. Body comparatively slender; depth 6 in length; head $3\frac{1}{2}$.
- d. Teeth in jaws all small, subequal. *Æquidens*. 10.
- dd. Teeth in jaws unequal, some of those in the outer row enlarged. *Belizana*. 11.

8. *Eleotris amblyopsis*.

Culius amblyopsis Cope, Proc. Am. Phil. Soc., 1870, 473 (Surinam); Goode & Bean, Proc. U. S. Nat. Mus., 1882, 236 (Gulf of Mexico); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 610 (Charleston); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 619 (Pensacola); Jordan & Gilbert, Syn. Fish. N. A., 1882, 944.

Habitat.—Atlantic coast of America, from Charleston to Surinam.

Only three specimens of this species are yet known. It is well distinguished from its congeners by its larger scales.

9. *Eleotris pisonis*.

Eleotris capite plagioplateo, etc. "Gronow, Mus. Ichth., ii, n. 168," 1757.

Gobius pisonis Gmelin, Syst. Nat. 1206, 1788 (based on *Eleotris* of Gronow).

Eleotris pisonis Bloch & Schneider, Syst. Ichth., 68, 1801 (based on *Eleotris* of Gronow).

Gobius pisonis Turton, Syst. Nat., 751, 1807 (South America).

Gobius amorea Walbaum, Artedi Piscium, iii, 205, 1792 (based on *Eleotris* of Gronow).

Eleotris gyrimus Cuvier & Valenciennes, xii, 220, 1837, Pl. 356 (Martinique, San Domingo, Surinam); Girard, U. S. and Mexican Boundary Survey, 28, Pl. xii, figs. 11-12, 1859 (Rio Grande); Günther, Catalogue Fish. in Brit. Mus., iii, 122, 1861; Poey, "Repert., i, 336," 1867; Poey, Syn. Pisc. Cubens., 395, 1868 (Cuba); Poey, Enumer. Pisc. Cub., 127, 1875 (Cuba); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 571 (name only); Jordan & Gilbert, Syn. Fish. N. A., 631, 1883.

Eleotris picta Kner & Steindachner, Abhandl. bayer. Ak. Wiss., 1864, 18, Pl. 3, fig. 1 (Rio Bayano, near Panama).

Culius perniger Cope, Proc. Am. Phil. Soc., 1870, 473 (St. Martins).

Habitat.—Both coasts of Central America, north to Cuba and Texas, chiefly in fresh waters.

The *Gobius pisonis* of Gmelin and its synonym, *Gobius amorea* of Walbaum, are based on the *Eleotris* of Gronow. This is undoubtedly identical either with *Eleotris gyrimus* or *Guavina guavina*. To us there is little doubt that the former species was the one intended, as the phrase "P. D. prior declinata 6 radiata; secunda equalis, priori vicina" applies well to the *Eleotris gyrimus* and not at all to the *Guavina guavina*, in which species the second dorsal is much larger than the first. We therefore adopt the name *Eleotris pisonis* instead of *Eleotris gyrimus*.

We have examined numerous specimens of this species from the Rio Almendares, near Havana. All these possess the antrorse preopercular spine supposed to distinguish the genus *Culius* from *Eleotris*. In the larger ones it is partly hidden by the encroachment of the skin and from this has arisen the erroneous supposition (of Günther and others) that this species is one in which the spine is wanting.

A comparison of the figure and description of *Eleotris picta*, given by Kner and Steindachner, shows no constant point of difference whatever. We therefore regard *picta* as a synonym of *pisonis*.

The *Culius perniger* of Cope is evidently identical with *pisonis*, Professor Cope being the first describer of the species who did not overlook the preopercular spine.

10. *Eleotris æquidens*.

Eleotris sp., Bean, Proc. U. S. Nat. Mus., 1880, 83 (name only).

Culius æquidens Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 461 (Mazatlan); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 372 (Colima); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 380 (Cape San Lucas, San José); Jordan & Gilbert, Bull. U. S. Fish Com., 1882, 108 (Mazatlan).

Habitat.—Streams about the Gulf of California, south to Colima.

This species is known to us from the original description by Jordan and Gilbert; it is said to be abundant in the streams of Sinaloa and Lower California.

11. *Eleotris belizana*.

Culius belizanus Sauvage, "Bull. Soc. Philom. Paris, 1879, 16 (reprint)" (Belize); Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 462 (foot-note).

Habitat.—Belize.

This species is known to us only from a foot-note by Jordan and Gilbert, referring to the description by M. Sauvage. It is said to differ from *E. æquidens*, by having the teeth of the outer row enlarged.

5. *EROTELIS*.

Ereotelis Poey, Memorias de Cuba, ii, 273, 1861 (*valenciennesi* = *smaragdus*).

This genus differs from the others in having the scales small, cycloid, the body long, slender, and the tail lanceolate. In form this genus differs strikingly from *Eleotris*, its nearest ally. It presents a strong analogy to *Gobionellus*, differing from *Eleotris* much as the latter does from *Gobius*.

But one species seems to be known.

Unlike the other *Eleotridinæ*, this is strictly marine, inhabiting the coarse algæ on the coral reefs.

Analysis of Species of Erotelis.

- a. Body long, slender; depth about $\frac{1}{3}$ the length to base of caudal; head broad, depressed; mouth large, very oblique, the lower jaw projecting. Maxillary reaching to below centre of eye, its length, $2\frac{1}{2}$ in head. Vomer without teeth; teeth on jaws small, equal. Scales small, cycloid, about 100 in a longitudinal series, largest on caudal peduncle. Caudal fin lanceolate; caudal peduncle slender, 3 in length of body. D. VI-1, 9; A. I-9. Gill-openings extending forward to below centre of opercle. Post-temporals diverging, inserted near occipital crest, which is obsolete. Skull uneven and rather thick. Preopercular spine absent. Vertebrae 10+15. Pectorals reaching past middle of first dorsal. Dorsal and anal high; highest anal ray $1\frac{1}{2}$ in head. *Smaragdus*. 12.

12. *Erotelis smaragdus*.

Eleotris smaragdus Cuvier & Valenciennes, xii, 231, 1837 (Cuba); Guichenot, "Poiss. in Ramon de la Sagra, Hist. Cuba, 130," 1855; Günther, Cat. iii, 123, 1861 (Cuba); Jordan, Proc. U. S. Nat. Mus., 1884, 141 (Key West).

Erotelis valenciennesi Poey, Mem. de Cuba, ii, 173, 1861 (Cuba); Poey, Syn. Pisc. Cub., 396, 1868 (Cuba); Poey, Enum. Pisc. Cub., 127, 1875 (Cuba).

Habitat.—Florida Keys to Cuba ; strictly marine, not ascending rivers.

This species is rather abundant on the coast of Cuba. A single specimen was obtained by Professor Jordan at Key West. It reaches a length of about a foot. It is confounded by Cuban fishermen with the Esmeralda (*Gobionellus*), although it lacks the emerald-colored prominences on the tongue. From this confusion the not appropriate name of *smaragdus* has come to be given to this species. This Poey has proposed to change to *Valenciennesi*; but this change the law of priority forbids.

6. GYMNELEOTRIS.

Gymneleotris Bleeker, Esquisse d'un Syst. Nat. des Gobioides, 304, 1874 (*seminuda*).

The distinguishing mark of this genus seems to be the absence of scales on the head and anterior part of the trunk. Nothing is known either of the genus or of its single species, except what is contained in Günther's description of the latter.

Analysis of the Species of Gymneleotris.

- a. Head and trunk naked; tail covered with small scales; head $\frac{2}{7}$ of total length; maxillary extending to below anterior margin of orbit. Teeth in upper jaw in a narrow band; the lower has four somewhat larger and recurved teeth in front; palate toothless. Fin-rays not prolonged. Pectorals not quite extending to origin of second dorsal. Ventrals much shorter than pectoral. D. VII, 11; A. 9.

Seminuda. 13.

13. *Gymneleotris seminuda*.

Eleotris seminuda, Günther, Proc. Zoological Soc., London, 1864, 24, "Plate iv, f. 2, 2a" (Pacific Coast of Panama); Günther, Fish. Central America, 441, 1869.

Gymneleotris seminuda Bleeker, Esquisse d'un Systema Nat. Gobioides, 304, 1874.

This species is known from the description by Dr. Günther of a small specimen in the British Museum.

LIST OF NOMINAL SPECIES OF ELEOTRIDINÆ, ARRANGED IN CHRONOLOGICAL ORDER, WITH IDENTIFICATIONS.

(Tenable Specific Names are in Italics.)

<i>Nominal Species.</i>	<i>Date.</i>	<i>Identification.</i>
<i>Gobius pisonis</i> Gmelin,	1788,	<i>Eleotris pisonis</i> .
<i>Sciaena maculata</i> Bloch,	1790,	<i>Dormitator maculatus</i> .
<i>Gobius amorea</i> Walbaum,	1792,	<i>Eleotris pisonis</i> .
<i>Gobiomorus dormitor</i> Lacépède,	1798,	<i>Gobiomorus dormitor</i> .
<i>Platycephalus dormitator</i> Bloch & Schneider,	1801,	" "
<i>Batrachus guavina</i> Bloch & Schneider,	1801,	" "
<i>Eleotris mugiloides</i> Cuvier & Valenciennes,	1837,	<i>Dormitator maculatus</i> .
<i>Eleotris guavina</i> Cuvier & Valenciennes,	1837,	<i>Guavina guavina</i> .
<i>Eleotris gyrinus</i> Cuvier & Valenciennes,	1837,	<i>Eleotris pisonis</i> .
<i>Eleotris smaragdus</i> Cuvier & Valenciennes,	1837,	<i>Erotelis smaragdus</i> .
<i>Eleotris latifrons</i> Richardson,	1837,	<i>Dormitator latifrons</i> .
<i>Eleotris somnolentus</i> Girard,	1858,	<i>Dormitator maculatus</i> .
<i>Lembus maculatus</i> Günther,	1859,	<i>Gobiomorus maculatus</i> .
<i>Philypnus lateralis</i> Gill,	1860,	<i>Gobiomorus lateralis</i> .
<i>Eleotris omocyanus</i> Poey,	1860,	<i>Dormitator maculatus</i> .
<i>Eleotris gundlachi</i> Poey,	1860,	" "
<i>Erotelis valenciennesi</i> Poey,	1861,	<i>Erotelis smaragdus</i> .
<i>Dormitator lineatus</i> Gill,	1863,	<i>Dormitator maculatus</i> .
<i>Dormitator microphthalmus</i> Gill,	1863,	<i>Dormitator latifrons</i> .
<i>Eleotris longiceps</i> Günther,	1864,	<i>Gobiomorus longiceps</i> .
<i>Eleotris seminuda</i> Günther,	1864,	<i>Gymneleotris seminuda</i> .
<i>Eleotris picta</i> , Kner & Steindachner,	1864,	<i>Eleotris pisonis</i> .
<i>Culius amblyopsis</i> Cope,	1870,	<i>Eleotris amblyopsis</i> .
<i>Culius perniger</i> , Cope,	1870,	<i>Eleotris pisonis</i> .
<i>Culius belizanus</i> Sauvage,	1879,	<i>Eleotris belizana</i> .
<i>Culius æquidens</i> Jordan & Gilbert,	1881,	<i>Eleotris æquidens</i> .

RECAPITULATION.

In this review we have admitted 13 species and 6 genera of *Eleotridinæ* as probably valid. We give here a list of the species. The general distribution of the species is indicated by the letters W. (Western Atlantic, West Indies, etc.); U. (Coast of United States); P. (Eastern Pacific, Mazatlan, Panama, etc.); G. (Western slopes of South America).

SUBFAMILY **Eleotridinæ.**

Genus 1. **GOBIOMORUS** Lacépède.

1. *Gobiomorus lateralis* Gill (P.).
2. *Gobiomorus maculatus* Günther (G.). (Species unknown to us.)
3. *Gobiomorus dormitator* Lacépède (W. U.).
4. *Gobiomorus longiceps* Günther (W.).

Genus 2. **DORMITATOR** Gill.

5. *Dormitator maculatus* Bloch (U. W.). (Possibly more than one species in our synonymy.)
6. *Dormitator latifrons* Richardson (P.). (Possibly a variety of *maculatus*.)

Genus 3. **GUAVINA** Bleeker.

7. *Guavina guavina* Cuvier and Valenciennes (W.).

Genus 4. **ELEOTRIS** (Gronow) Bloch & Schneider.

8. *Eleotris amblyopsis* Cope (U. W.).
9. *Eleotris pisonis* Gmelin (W. P.). (Possibly two species contained in our synonymy.)
10. *Eleotris æquidens* Jordan and Gilbert (P.).
11. *Eleotris belizana* Sauvage (W.). (Unknown to us.)

Genus 5. **EROTELIS** Poey.

12. *Erotelis smaragdus* Cuvier and Valenciennes (U. W.).

Genus 6. **GYMNELEOTRIS** Bleeker.

13. *Gymneleotris seminuda* Günther (P.). (Unknown to us.)